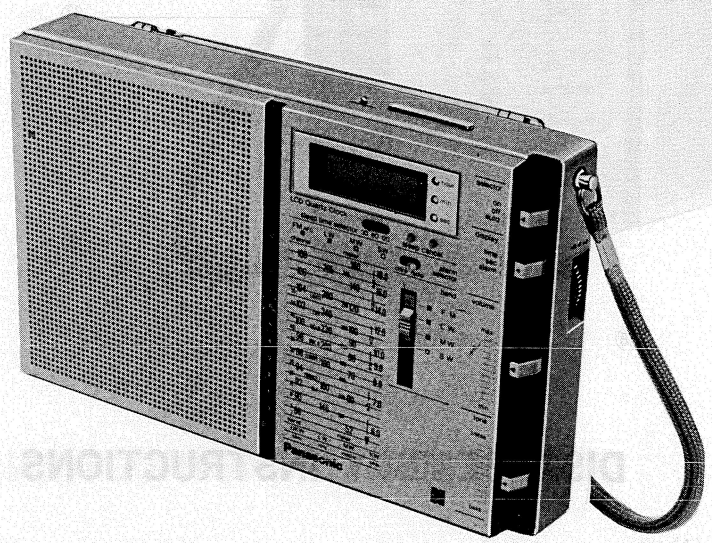
ORDER NO. RD7908-1724C

Service Manual

Radio

RF-096L

FM-AM 4-Band Portable Radio with Quartz Clock



■ SPECIFICATIONS

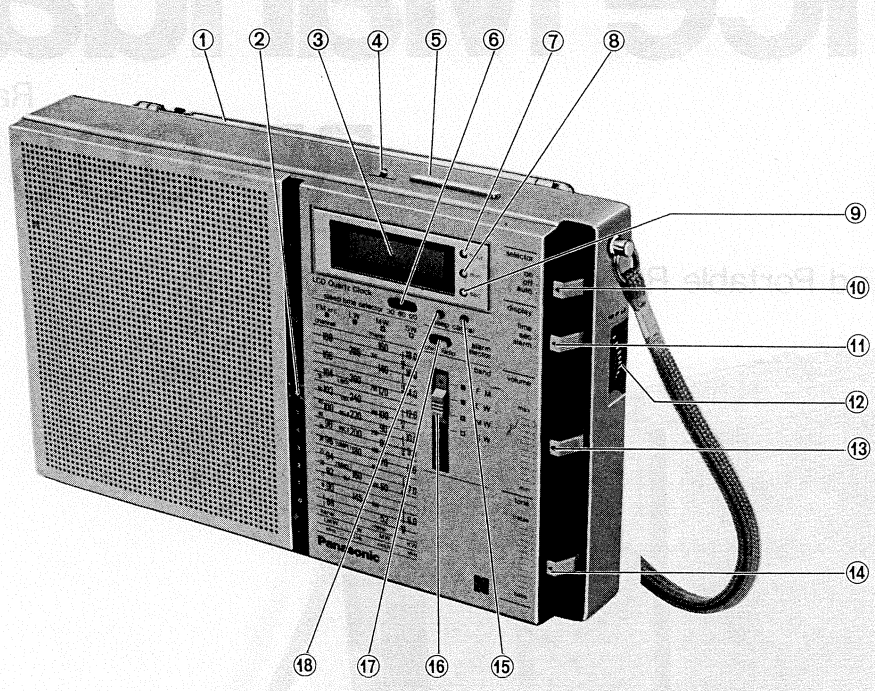
Frequency Range:	FM 87.5~108 MHz LW 145~285 KHz (2060~1060 m) MW 520~1610 KHz (577~186 m) SW 5.9~18 MHz (50.8~16.7 m)
Intermediate Frequency:	FM 10.7 MHz AM (LW, MW & SW) 455 kHz
Sensitivity:	FM 2μV for 50mW Output LW 100μV/m for 50mW Output MW 50μV/m for 50mW Output SW 6μV for 50mW Output
Power Output:	550mW Maximum
Batteries:	Radio; 6 V (Four "AA" Size Penlight Batteries) Clock; 1.5 V (One "AA" Size Penlight Battery) (National UM-3 or equivalent)
Speaker:	8 cm (3") PM Dynamic Speaker
Dimensions:	207(Wide) x 128.5(High) x 46.5(Dep) mm ($8\frac{3}{16}$" x $5\frac{3}{16}$" x $1\frac{7}{8}$")
Weight:	680 g. (1 lb 7.99 oz.) without batteries
Impedance:	Speaker ..... 8Ω Earphone Jack 8Ω

Specifications are subject to change without notice.

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka, Japan

LOCATION OF CONTROLS AND COMPONENTS



① Telescopic Antenna
② LED Tuning Indicator
③ Clock Display
④ Clock Light Button
⑤ Doze Button
⑥ Sleep Time Selector
⑦ Hour Control Button
⑧ Minute Control Button
⑨ Second Control Button
⑩ Power/Auto Switch
⑪ Display Switch
⑫ Tuning Knob
⑬ Volume Control
⑭ Tone Control
⑮ Cancel Button
⑯ Band Selector
⑰ Alarm Selector
⑱ Sleep Button

DISASSEMBLY INSTRUCTIONS

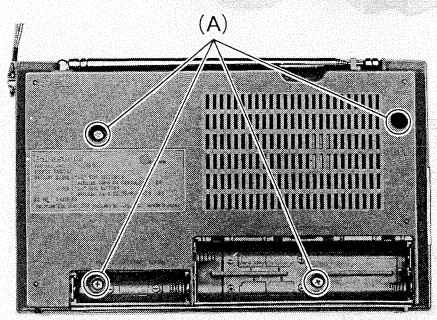


Fig. 2

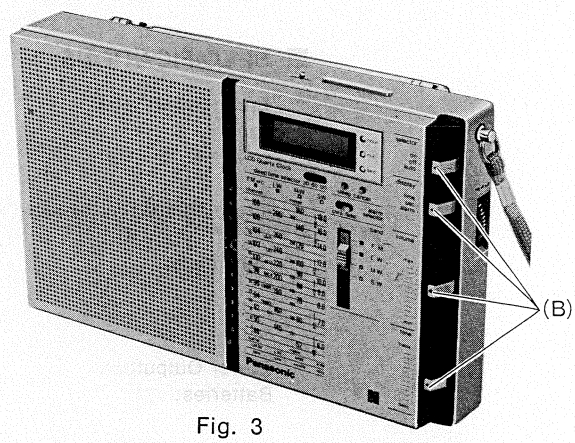


Fig. 3

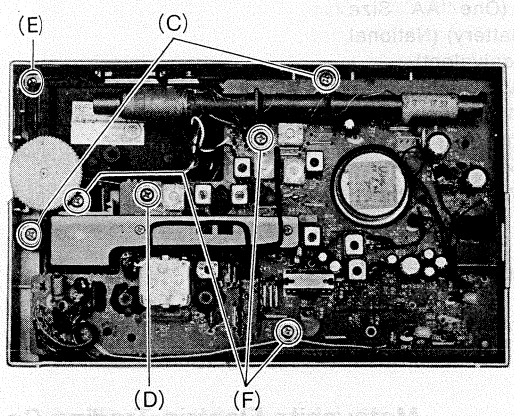


Fig. 4

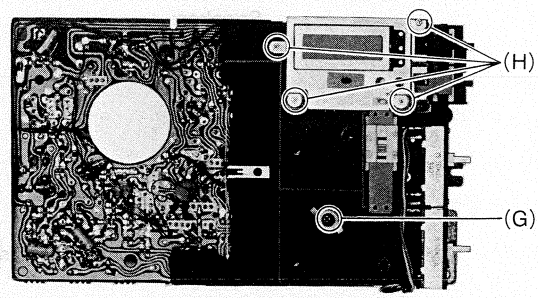


Fig. 5

Procedure	To remove—.	Remove—.	Shown in Fig.—
1	Cabinet Cover	Screw (3×20) .....(A)×4	2
2	Chassis ※1	Knob .....(B)×4	3
3		Red Screw (3×10) .....(C)×2	4
4		Red Screw (3×20) .....(D)×1	4
5		Red Screw (2×8) .....(E)×1	4
6	Dial Chassis ※2, 3	Screw (3×10) .....(F)×3	4
7		Screw (2.6×5) .....(G)×1	5
8	Quartz Block	Screw (2×8) .....(H)×4	5

※1. If removing chassis, dial light button would be taken off together.
※2. To reassemble the dial chassis, turn tuning knob and variable capacitor shaft to fully counter-clockwise.
※3. To reassemble the dial chassis, set band knob and band switch to FM position.

■HOW TO ASSEMBLY THE CLOCK BLOCK

1. Note that polarization plate, LCD and reflection plate must be installed under the specified conditions as shown in Fig. 6 and 7.
2. Before replacing with new polarization plate, LCD and reflection plate remove the sheet cover of then.

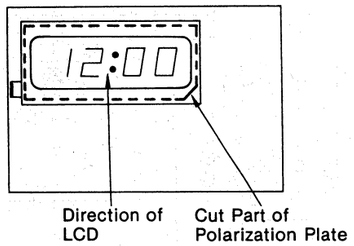


Fig. 6

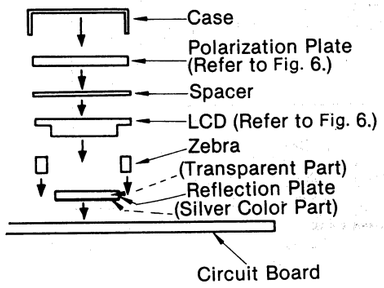


Fig. 7

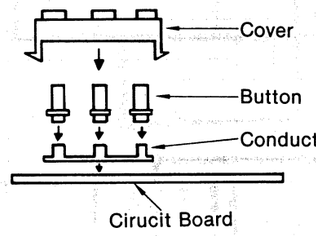


Fig. 8

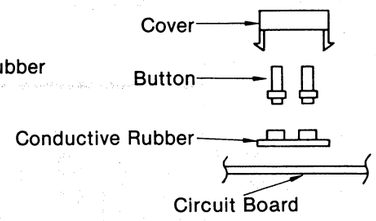


Fig. 9

DIAL THREADING

Cord length is 90cm(35 7/16")

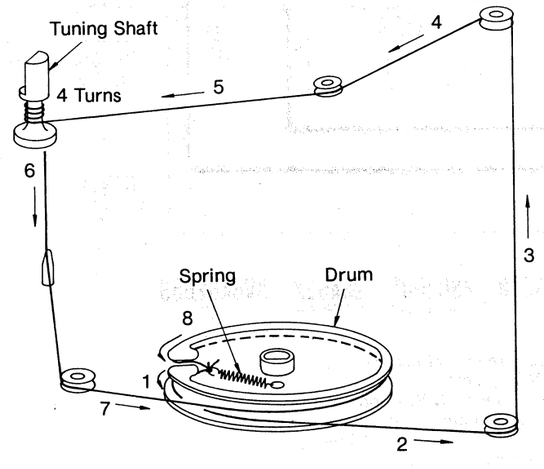


Fig. 10

ALIGNMENTS

■ ALIGNMENT INSTRUCTION

1. Set volume control to maximum.
2. Set tone control to treble.
3. Set band switch to LW, MW, SW or FM.
4. Set power source voltage to 6 V DC.
5. Output of signal generator should be no higher than necessary to obtain an output reading.

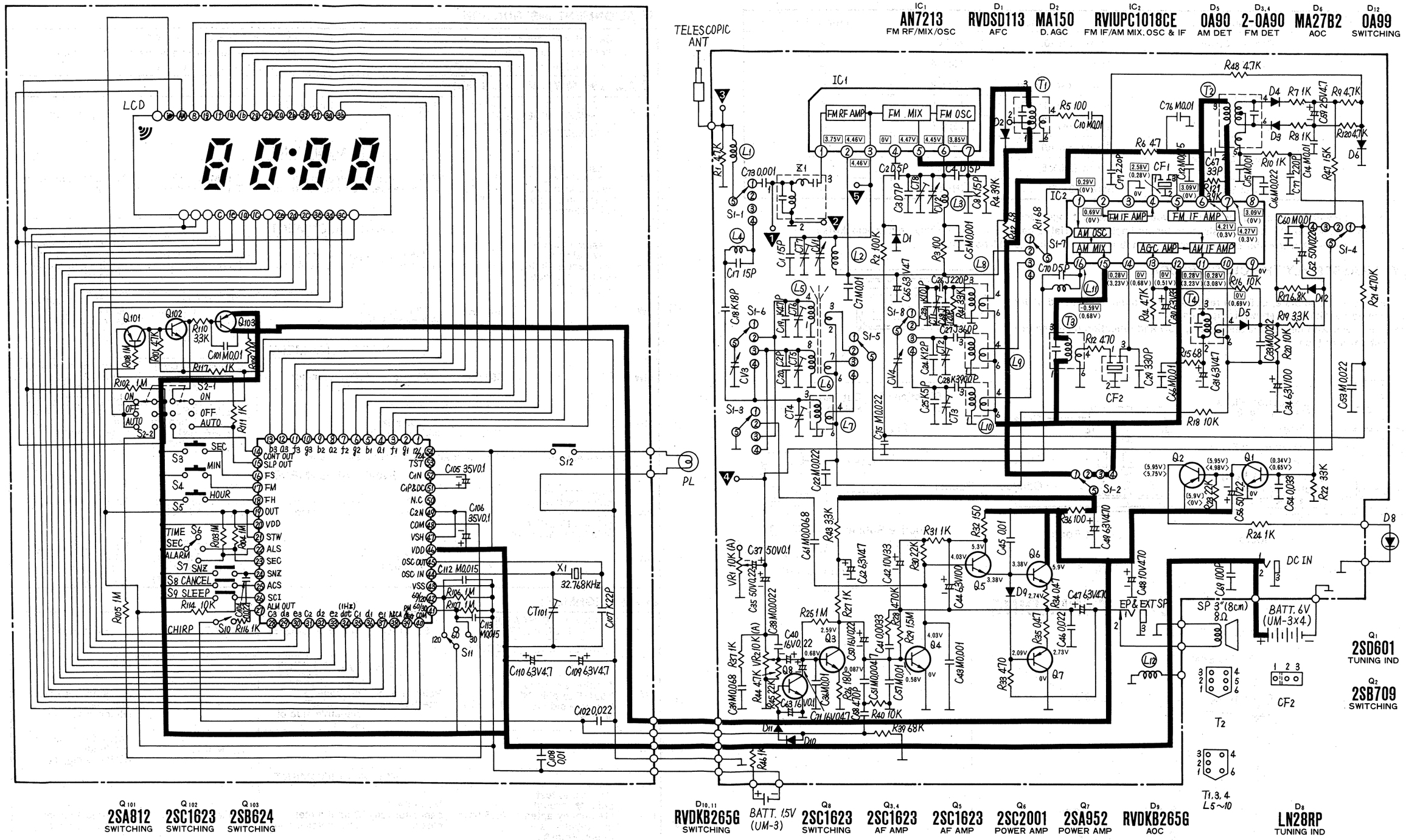
■ AM (LW, MW, SW) ALIGNMENT

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR CONNECTIONS	SIGNAL GENERATOR or SWEEP GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
		AM IF ALIGNMENT					
(1)	AM	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. at 400 Hz	Point of non-interference.	Output meter across voice coil.	T_3(AM 1st IFT) T_4(AM 2nd IFT)	Adjust for maximum output.
		LW-RF ALIGNMENT					
(2)	LW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	145 kHz	145 kHz 6.7 mm(1/4")	Output meter across voice coil.	L_8(LW OSC Coil) (＊1) L_5(LW ANT Coil)	Adjust for maximum output. Adjust L_5 by moving coil bobbin along ferrite core.
(3)	LW	〃	285 kHz	285 kHz 55.8 mm(2 3/16")	〃	CT_1(LW OSC Trimmer) CT_6(LW ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
		MW-RF ALIGNMENT					
(4)	MW	〃	550 kHz	550 kHz 6.7 mm(1/4")	Output meter across voice coil.	L_9(MW OSC Coil) (＊1) L_6(MW ANT Coil)	Adjust for maximum output. Adjust L_6 by moving coil bobbin along ferrite core.
(5)	MW	〃	1500 kHz	1500 kHz 55.8 mm(2 3/16")	〃	CT_2(MW OSC Trimmer) CT_5(MW ANT Trimmer)	Adjust for maximum output. Repeat steps (4) and (5).
	(＊1) Cement antenna bobbin with wax after completing alignment.						
		SW-RF ALIGNMENT					
(6)	SW	Connect to test point ▼ through ceramic capacitor (10 pF). Negative side to test point ▼.	5.9 MHz	5.9 MHz 2.3 mm(1/8")	Output meter across voice coil.	L_{10}(SW OSC Coil) L_7(SW ANT Coil)	Adujst for maximum output.
(7)	SW	〃	18 MHz	18 MHz 58.9 mm(2 5/16")	〃	CT_3(SW OSC Trimmer) CT_4(SW ANT Trimmer)	Adjust for maximum output. Repeat steps (6) and (7).

■ FM ALIGNMENT

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR CONNECTIONS	SIGNAL GENERATOR or SWEEP GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
		FM-IF ALIGNMENT					
(1)	FM	Positiue side thru, 0.001μF to point ▼. Negative side to point ▼.	10.7 MHz	Point of non-interference	Connect vert. of scope to test point ▼. Negative side ot earth.	T_1(FM IFT)	Adjust for maximum amplitude. (Refer to Fig. 12.)
(2)	FM	〃	〃	〃	〃	T_2(FM IFT)	Adjust for maximum amplitude. (Refer to Fig. 13.)
		FM-RF ALIGNMENT					
(3)	FM	Connect to test point ▼ through FM dummy antenna. Negative side to etst Point ▼. (Refer to Fig. 14.)	87.5 MHz	Variable capacitor fully closed.	Output meter across voice coil.	L_3(FM OSC Coil)	(＊2)Adjust for maximum output.
(4)	FM	〃	90 MHz	90 MHz	Tune to signal	L_2(FM TUNE Coil)	(＊2)Adjust for maximum output.
(5)	FM	〃	106 MHz	106 MHz 52.3 mm(2 1/16")	〃	CT_8(FM OSC Trimmer) CT_7(FM TUNE Trimmer)	(＊2)Adjust for maximum output. Repeat steps. (3)～(5).
	(＊2) Three output responses will be present; proper tuning is the center frequency.						

SCHEMATIC DIAGRAM-MODEL RF-096L



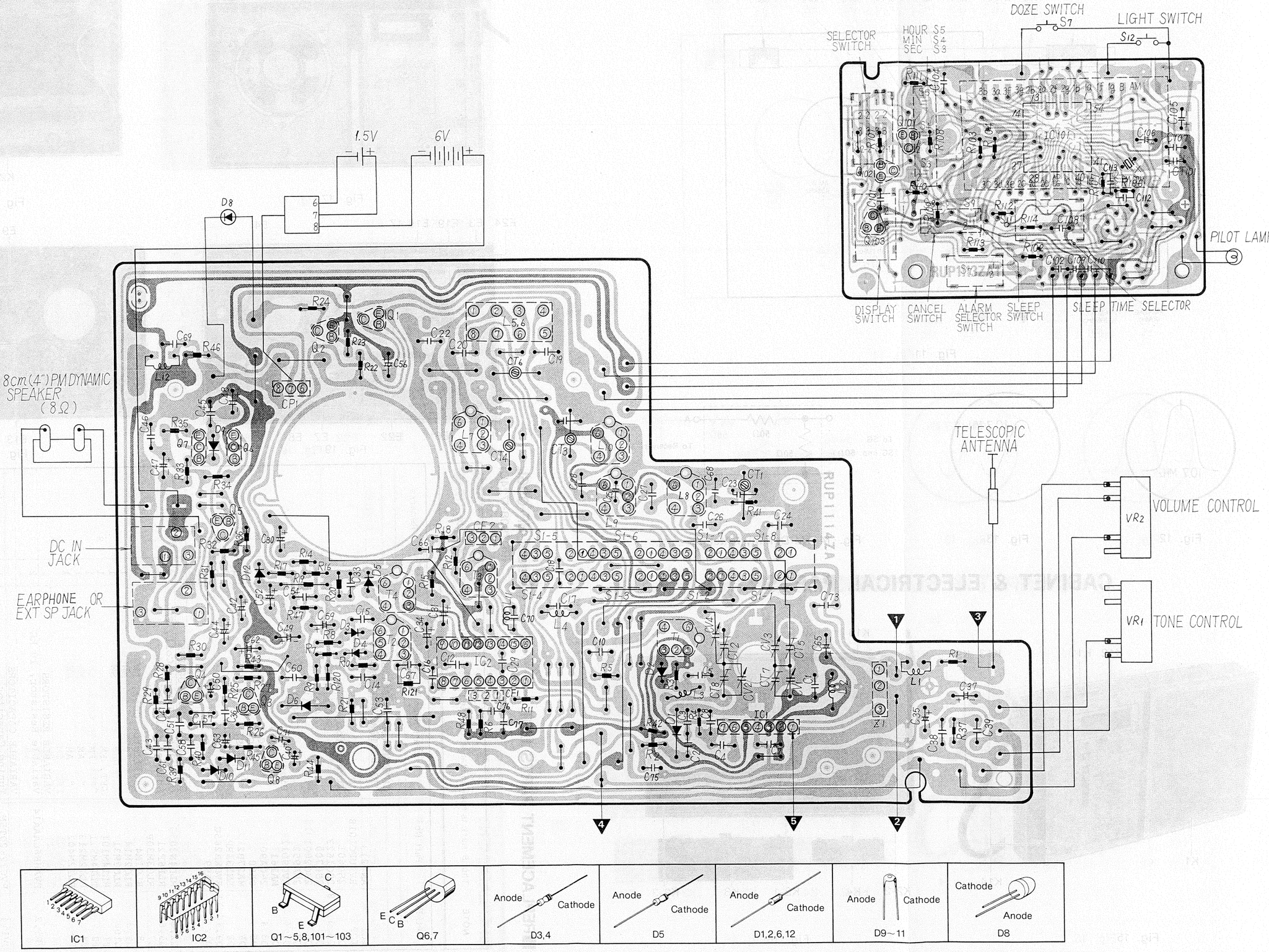
Notes:

1. S_{1-1}～S_{1-8}: Band switch in "FM" position.
2. S_{2-1}～S_{2-2}: Selector Switch in "ON" Position. (1...ON, 2...OFF, 3...AUTO)
3. S_3: Second switch.
4. S_4: Minute switch.
5. S_5: Hour switch.
6. S_6: Display switch in "TIME" Position.
7. S_7: Doze switch.
8. S_8: Cancle switch.
9. S_9: Sleep switch.
10. S_{10}: Alarm selector switch in "chirp" Position.
11. S_{11}: Sleep time selector switch.
12. S_{12}: Light switch.
13. DC voltage measurements are taken with electronics

Volumeter basedon negative terminal of battery.
□...FM Position, ( )...AM Position
〔 〕...LED OFF Position, 〈 〉...LED ON Position

14. For resistor and capacitors, using chips except ※ mark.
15. Battery current No signal.....33mA.
    Maximum output .....170mA.

CIRCUIT BOARD WIRING VIEW–MODEL RF-096L



Q1

	LED	
	ON	OFF
C	4.98V	5.95V
B	0.65V	0.34V
E	0 V	0 V

Q2

	LED	
	ON	OFF
C	5.75V	5.95V
B	4.98V	5.95V
E	0 V	5.9V

Q3

C	2.59V
B	0.68V
E	0.087V

Q4

C	4.03V
B	0.58V
E	0 V

Q5

C	5.3V
B	4.03V
E	3.38V

Q6

C	5.9V
B	3.38V
E	2.74V

Q7

C	0 V
B	2.09V
E	2.73V

IC1

	FM
1	3.75V
2	4.46V
3	4.46V
4	0 V
5	4.47V
6	4.45V
7	3.58V

IC2

	AM	FM		AM	FM
1	0 V	0.29V	9	0 V	0 V
2	0 V	0.69V	10	0.69V	0 V
3	0 V	0 V	11	3.08V	0.28V
4	0.28V	2.58V	12	3.23V	0.28V
5	0 V	3.09V	13	0.51V	0 V
6	0.3V	4.21V	14	0.68V	0 V
7	0.3V	4.27V	15	3.23V	0.28V
8	0 V	3.09V	16	0.68V	−0.59V

■ ALIGNMENT POINTS

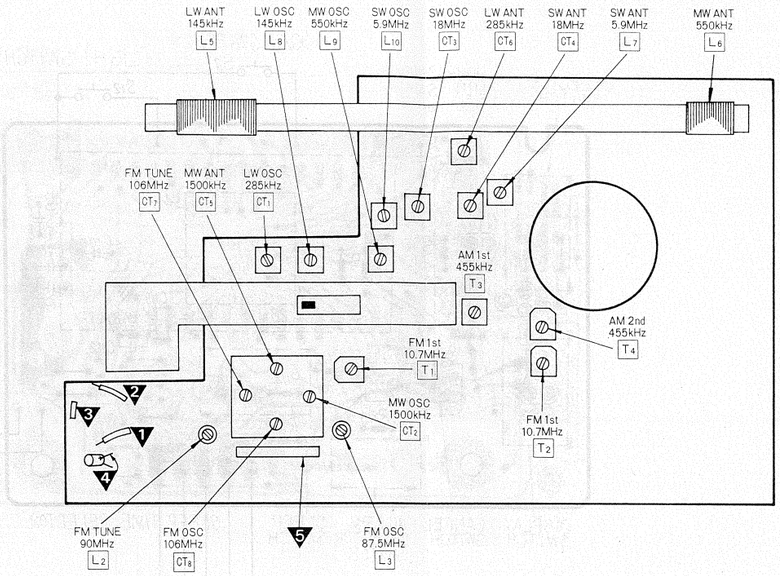


Fig. 11

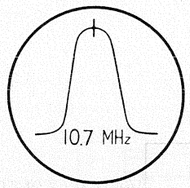


Fig. 12

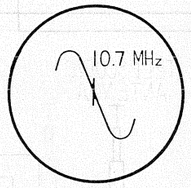


Fig. 13

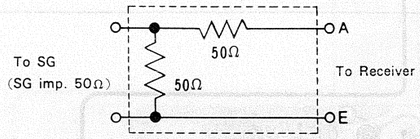


Fig. 14 FM Dummy Antenna

CABINET & ELECTRICAL PARTS

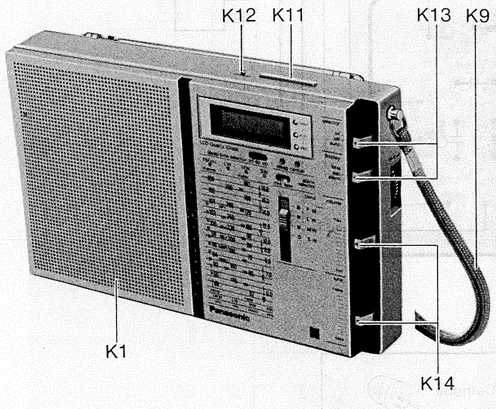


Fig. 15

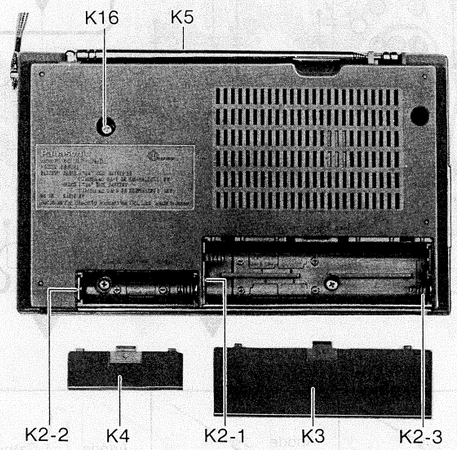


Fig. 16

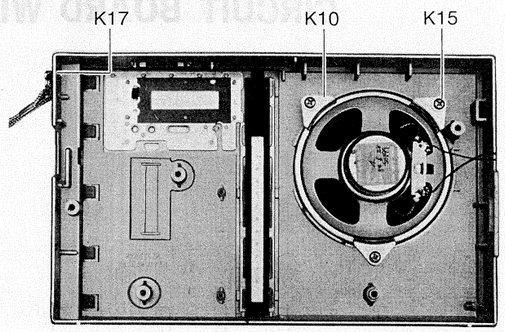


Fig. 17

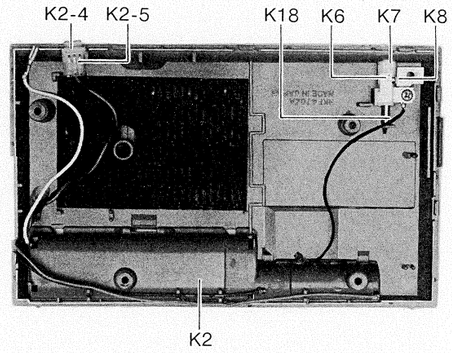


Fig. 18

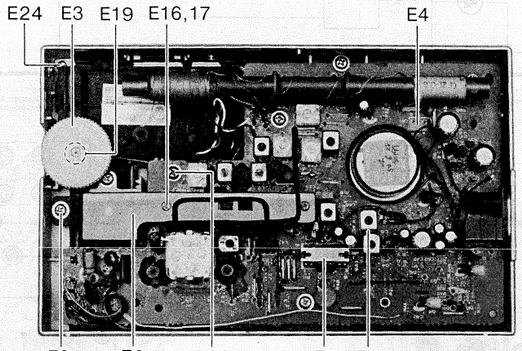


Fig. 19

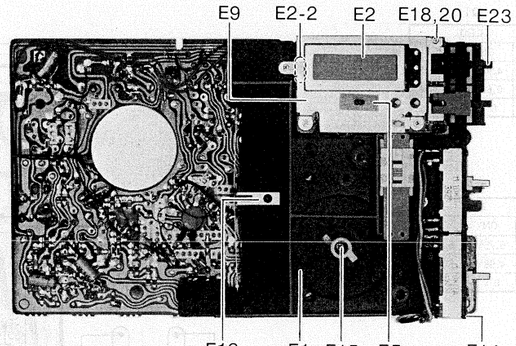


Fig. 20

■REPLACEMENT PARTS LIST..... Model RF-096L (RD7908-1724C)

NOTE The S mark is service standard parts and may differ from production parts.

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
		INTEGRATED CIRCUITS, TRANSISTORS AND DIODES		
IC1	AN7213	IC	1	
IC2	RVTUPC1018	IC	1	
Q1	2SD601	Transistor (Si)	1	
Q3,4,5,8	2SC1623	" (Si)	4	
Q2	2SB709	" (Ge)	1	
Q6	2SC2001	" (Si)	1	
Q7	2SA952	" (Ge)	1	
D1	RVDSD113	Diode (Si)	1	S
D2	MA161	" (Si)	1	S
D3,4	2-OA90	" (Ge)	2	S
D5	OA90	" (Ge)	1	S
D6	MA27B2	" (Si)	1	
D8	LN23SRP	" (Ga)	1	
D9,10,11	RVDKB265G	" (Si)	3	S
D12	OA99	" (Ge)	1	S
		COILS AND TRANSFORMERS		
L2,3	RLD4N30	Oscillator, Tuning Coil, FM	2	
L5,6	RLF6F21	Antenna Coil, LW, MW	1	
L7	RLO3M30P	" SW	1	
L8	RLO1M4	Oscillator Coil, LW	1	
L9	RLO2M14	" MW	1	
L10	RLO3M31	" SW	1	
T1	RLI4M101	IFT, FM	1	S
T2	TLI4M511	" FM	1	
T3	RLI2M213	" AM	1	
T4	RLI2M402	" AM	1	
		VARIABLE RESISTORS		
VR1,2	EVAHH6CAAA14	Variable Resistor, 10 kΩ	2	
		VARIABLE CAPACITORS		
CV1^4	PVC22K20T5M	Tuning Capacitor (w/Trimmer TC2,5)	1	
CT3,4	RCV1PX10AGS	Trimmer Capacitor	2	
CT1,6	RCV1PX30AGS	"	2	
		CERAMIC FILTERS		
CF1	RVF107MFZ	Ceramic Filter	1	
CF2	RVFCFM2455B	"	1	
		COMPONENT COMBINATION		
Z1	RXABPMB3	Band Pass Filter	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
		SPEAKER		
	EAS8P29SS	Speaker, 8cm (3"), 8 Ω	1	
		SWITCHES		
S1	RSS4H01Z	Switch, Band	1	
S2,6	RSS3B07Z	" Selector	2	
S10	RSS2A20Z	" Alarm Selector	1	
S11	RSS3A04Z	" Sleep Time Selector	1	
		JACK		
	RJJ85A	Jack, EP/DCIN	1	S
		RESISTORS (Value is in OHMS)		
R6	RRD18XK470	47 1/8W Chip	1	
R11,15, 42	RRD18XK680	68 " "	3	
R3,5,36	RRD18XK101	100 " "	3	
R32	RRD18XK151	150 " "	1	
R13,26	RRD18XK181	180 " "	2	
R12,33	RRD18XK471	470 " "	2	
R7,8,10,24,27,31,37,46	RRD18XK102	1 K " "	8	
R30	RRD18XK222	2.2 K " "	1	
R19,43	RRD18XK332	3.3 K " "	2	
R9,44,48,120	RRD18XK472	4.7 K " "	4	
R16,18,20,40	RRD18XK103	10 K " "	4	
R23,45	RRD18XK223	22 K " "	2	
R17	RRD18XK682	6.8 K " "	1	
R1,14	RRD18XK473	47 K " "	2	
R41,22	RRD18XK333	33 K " "	2	
R39	RRD18XK683	68 K " "	1	
R2	RRD18XK104	100 K " "	1	
R21,28	RRD18XK474	470 K " "	2	
R25	RRD18XK105	1 M " "	1	
R29	RRD18XK155	1.5 M " "	1	
R34,35	ERX12ANJR47	0.47 1/2W Metal	2	S
R47	RRD18XK153	15 K 1/8W Chip	1	
R4	RRD18XK393	39 K " "	1	
R121	ERD25TJ392	3.9 K 1/4W Carbon	1	S
		CAPACITORS (Value is in MICRO FARADS except P.P=PICO FARADS)		
C20	ECUX1H020CC	2 P 50V Chip	1	
C2,4,25,70	ECUX1H050DC	5 P " "	4	
C3	ECUX1H070DC	7 P " "	1	
C23	ECUX1H100KC	10 P " "	1	
C24	ECUX1H120KC	12 P " "	1	
C1,8,17	ECUX1H150KC	15 P " "	3	
C18	ECUX1H180KC	18 P " "	1	
C67	ECUX1H330KC	33 P " "	1	
C19	ECUX1H470KC	47 P " "	1	
C69	ECUX1H101KD	100 P " "	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C29	ECUX1H331KD	330 P 50V Chip	1	
C58	ECUX1H471KD	470 P " "	1	
C41	ECUX1H332MD	0.033 " "	1	
C73	ECUX1H102ZF	0.001 " "	1	
C5,43	ECUX1H102MD	0.001 " "	2	
C38	ECUX1H222MD	0.0022 " "	1	
C51	ECUX1H472MD	0.0047 " "	1	
C61	ECUX1H682MD	0.0068 " "	1	
C45	ECUX1H103ZF	0.01 " "	1	
C7,9,15,36,57,66	ECUX1H103MD	0.01 " "	6	
C46	ECUX1H223ZF	0.022 " "	1	
C16,22,33,53,75	ECUX1H223MD	0.022 " "	5	
C54	ECUX1H333ZF	0.033 " "	1	
C39	ECFVD683MD	0.068 25V Semi-Conductor	1	
C27	ECQSO5361JZ	360 P 50V Styrol	1	
C28	ECQSO5392KZ	3900 P " "	1	
C26	ECMSO5221JH	220 P " Mica	1	
C68	ECMSO5121JH	120 P " "	1	
C63	ECAG16ER1	0.1 16V Electrolytic	1	
C71	ECAG16ER47	0.47 " "	1	
C40,50	ECAG16ER22	0.22 " "	2	
C30,42	ECEA1CS330	33 " "	2	S
C31,34,62,65	ECEA1AS470	47 10V "	4	S
C44	ECEA1AS101	100 " "	1	S
C47,49	ECEA0JS471	470 6.3V "	2	S
C48	ECEA1AS471	470 10V "	1	S
C56	ECEA50Z2R2	2.2 50V "	1	S
C59	ECEA25Z4R7	4.7 25V "	1	S
C35,52	ECEA50ZR22	0.22 50V "	2	S
C37	ECEA50ZR1	0.1 " "	1	S
C77	ECUX1H221KD	220 P " Chip	1	
C10,76	ECKD1H103MD	0.01 " Ceramic	2	
C12	ECKD1H153MD	0.015 " "	1	
		CABINET PARTS		
K1	RYMF096LXG8	Cabinet Assembly	1	
K2	RYFF096LXG7	Cabinet Cover Assembly	1	
K2-1	RJC730Z	Terminal, Battery	1	
K2-2	RJC314A	Terminal, Battery + Side	2	
K2-3	RJC322Z	Spring, Battery - Side	2	
K2-4	RJS253Y-X	Socket, 3 Pin	1	
K2-5	RJT462Z-X	Terminal, Socket	3	
K3	RYNF096LXG	Battery Cover Assembly	1	
K4	RKK168Z7	Battery Cover	1	
K5	XEARR130GA	Telescopic Antenna, 7 Steps, 812 mm	1	
K6	RJT649Z	Terminal, Telescopic Antenna	1	
K7	RMA5083Z	Holder, Telescopic Antenna	1	
K8	RHM89Z	Stopper, Telescopic Antenna	1	
K9	RKH92Z7	Hand Strap	1	
K10	RMS12B	Bracket, Speaker	3	
K11	RBC204Z	Button, Doze	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
K12	RBC221Z	Button, Clock Light	1	
K13	RBD95Y1	Knob, Selector, Display	2	
K14	RBD96Y	Knob, Volume, Tone	2	
K15	XTW3+10F	Screw, Speaker, Telescopic Ant. etc.	7	
K16	XTB3+20BFN	Screw, Cabinet Cover M'tg	4	S
K17	XUC3FT	Circlip, Hand Strap M'tg	1	S
K18	XUC2FT	Circlip, Telescopic Antenna	1	S
		ELECTRICAL PARTS		
E1	RZAF096LXG	Dial Chassis Assembly	1	
E2	RSC14612Y	Quartz Clock Assembly	1	
E2-1	RADLDBU122D	LCD	1	
E2-2	XAMR18T20	Pilot Lamp	1	
E2-3	RJT658Z	Terminal, Pilot Lamp	1	
E2-4	RJT659Z	Terminal, Doze	1	
E2-5	RHG461Z	Conductive Rubber	1	
E2-6	RHG5002Z	"	1	
E2-7	RHG5003Z	"	2	
E2-8	RHR1074Z	Spacer	1	
E2-9	RDH158Z	Reflection Plate	1	
E2-10	RGP562Z	Polarization Plate	1	
E2-11	RBC216Z	Button, Time Set	3	
E2-12	RBC215Z	Button, Sleep, Cancel	2	
E2-13	RUV540Z	Cover, Button	1	
E2-14	RUV541Z	"	1	
E3	RBN510Z	Knob, Tuning	1	
E4	RJP137Z	Plug, Socket	1	
E5	RUV549Z	Cover, Switch	2	
E6	RMD9002Z	Switch Mechanism	1	
E7	RMC171Y	Shield Cover, IC	1	
E8	RMC272Z	" IFT	1	
E9	RMC589Z	"	1	
E10	RDD4016Z	Drum, Dial	1	
E11	RDS3060A	Spring, Dial	1	
E12	RDZ03Y	Cord, Dial	1 ROLL	
E13	RDP792Z	Pointer, Dial	1	
E14	XSN2+4	Screw, Volume M'tg	4	S
E15	XSN26+5	Screw, Tuning Capacitor M'tg	3	S
E16	XSN26+8	Screw, Mechanism M'tg	2	S
E17	XWA26B	Washer, Tuning Capacitor etc.	5	S
E18	XWE2+4BW	Washer, Clock M'tg	2	S
E19	XUC12FY-V	Circlip, Tuning Shaft	1	
E20	XTNR2+8CFN	Screw, Clock M'tg	4	
E21	XTW3+10FR	Red Screw, Chassis M'tg	2	
E22	XTW3+20FR	"	1	
E23	RUB193Z	Lever, Knob	2	
E24	XTNR2+8CR	Red Screw, Chassis M'tg	1	
		ACCESSORY		
	XEH1A1-P	Magnetic Earphone	1	S
		PACKING MATERIALS		
	RPK823Z	Gift Box	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
	RPE310Z	Cover	1	
	RPE311Z	Display Stand	1	
	RPN2930Z	Pad	1	
	RPH341Z	Soft Sheet	1	
	XZB30X25A03	Polyethylene Cover	2	
		PRINTED MATERIAL		
Y1	RQX6479Z	Instruction Book	1	

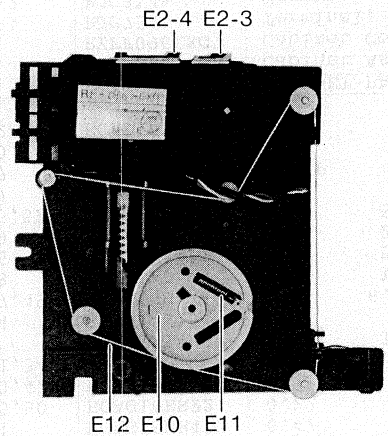


Fig. 21

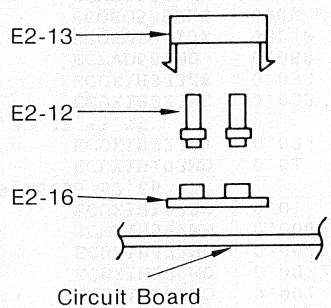


Fig. 23

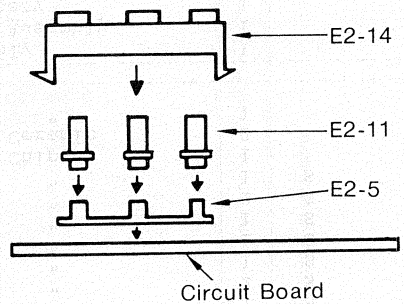


Fig. 22

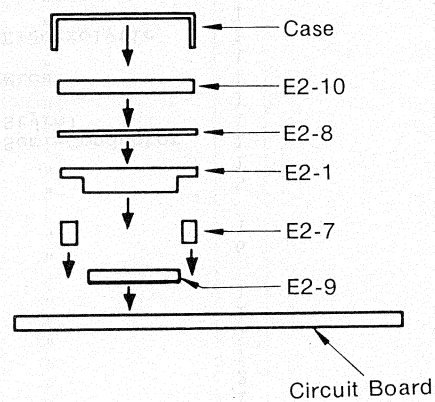


Fig. 24

RD Ⓕ XG/XI
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